MeetingReport

Microscopy & Microanalysis 2021 Virtual

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As we come to the close of 2021, the impact of the SARS-CoV-2 pandemic is ever-present in our daily lives. However, while there have been many challenges this year, our Microscopy Society of America and Microanalysis Society (MSA/MAS) leaders, volunteers, and members have worked tirelessly to strengthen connections within our community through the development and support of many virtual events. Our community-driven spirit surrounding science, education, and outreach is most evident at our annual meetings, and Microscopy & Microanalysis 2021 Virtual was no exception! Throughout the development of the 2021 meeting, countless options for an in-person, hybrid, or virtual meeting were considered as we followed the events of the pandemic. In the end, the decision to hold M&M 2021 as a virtual event was necessary. Nevertheless, with our collective virtual meeting experience, the Microscopy Society of America and the Microanalysis Society (MSA/MAS) society leaders and council members, meeting management team, program committee, and other stakeholders knew that a great meeting was already well on-track. Let's return to the experience by sharing a few program highlights from the M&M 2021 meeting!

The M&M 2021 meeting was successfully held online from August 1–5, 2021. The meeting materials, including talks and recorded Q&A sessions, were hosted online and were available for viewing for one month after the live meeting. 2,164 online attendees (1,792 scientific participants and 372 exhibitors) from around the world were present at M&M 2021! They were featured in 761 pre-recorded platform presentations and 391 posters. This year, we amped up solutions for attendees to connect with exhibitors and vendors at the M&M Expo Exhibition. Here, vendors showcased new developments, virtually demonstrating state-of-the-art instruments, preparative and support equipment, and novel services. Exhibitors were highlighted through spotlight sessions, vendor tutorials, and other peripheral events. For meeting "early-birds," two very well-attended virtual pre-meeting congresses and two fully-booked Sunday Short Courses were held. On Saturday, the fifth annual "X60 – Pre-Meeting Congress for Early Career Professionals in Microscopy & Microanalysis" was hosted by the MSA Student Council. The second pre-meeting event, "X62 – Recent Developments in Advanced Imaging and Spectroscopy," took place on Sunday, with a packed virtual house.

As we established the plenary sessions for the virtual meeting, we decided to hold them over several days so we could listen to and watch inspirational scientific talks and enjoy some lively, real-time conversation with our distinguished guests via "fireside chats." The biological sciences session was held on Monday morning with Drs. Jason McLellan and Barney Graham, two coronavirus experts and leaders in vaccine development, who discussed early days of the pandemic and the mobilization of the global virology research community to combat the deadly pathogen (Figure 1). Using information stemming from their research and that of others, multiple vaccines and other therapeutic agents were developed, approved, and deployed worldwide within a very short time span. Truly groundbreaking research was conducted where cryo-EM took the lead in high-resolution structural studies of the SARS-CoV-2 virus, spike protein, and other viral complexes. Even with the enormity of the challenge and the importance of their work, Drs. McLellan and Graham remain humble, down-to-earth individuals who are most enthusiastic about training and mentoring future generations of budding scientists.

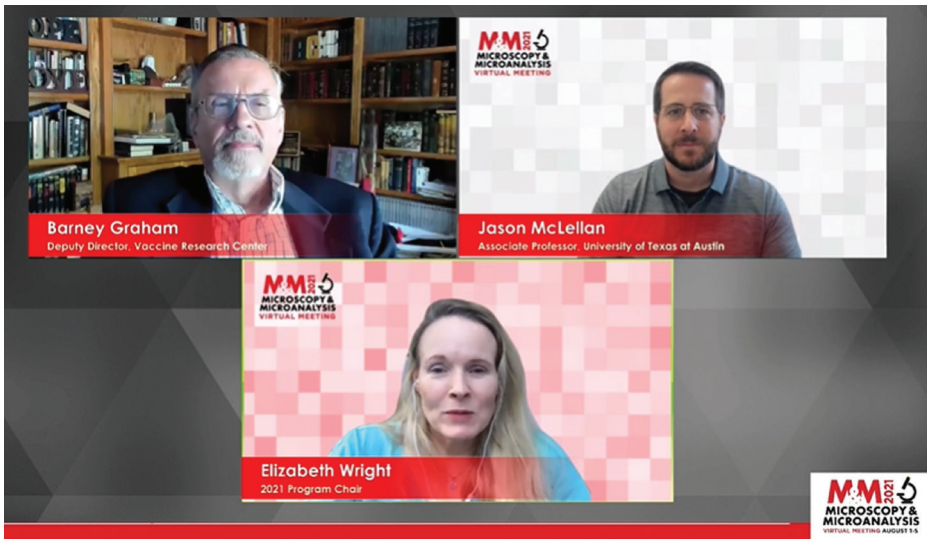

Figure 1: Program Chair Dr. Elizabeth Wright moderates the "fireside chat" with Drs. Jason McLellan and Barney Graham, two coronavirus experts and leaders in vaccine development, who discussed early days of the pandemic and the mobilization of the global virology research community to combat the deadly pathogen.

Figure 2: Dr. Ondrej Krivanek discusses his research during a "fireside chat."

Figure 3: Dr. Peter Crozier, MSA President, leads the Awards Ceremony during M&M 2021.

The physical sciences session was held on Tuesday morning with Dr. Ondrej Krivanek (Figure 2). Dr. Krivanek is a pioneer in the development of aberration-corrected high-resolution STEM and Electron Energy Loss Spectroscopy (EELS). He was one of the 2020 Kavli Prize in Nanoscience awardees for his work in sub-angstrom imaging resolution and elemental analysis using electron beams. Dr. Krivanek spoke eloquently about his work on the development of both electron and elemental spectroscopy technologies and how these tools have been used to investigate a broad range of different materials. With advanced microscopes, the first sub-angstrom resolution images were produced! Atomic-resolution EELS is now a standard within the materials science community. During his presentation and live chat, he linked these advances in instrumentation to the materials studied. Throughout his talk, he offered insight into the complexity of engineering necessary for the instruments used to resolve the fundamental building blocks of life.

One of the most important and memorable portions of an in-person M&M meeting is the awards ceremony that takes place during the plenary session! This is where MSA and MAS come together to honor our fellow scientists and their contributions to research, training, service, and outreach. To focus on recognizing this special group of individuals, we acknowledged our awardees during a special Awardees session held on Wednesday morning. Three award-winning microscopists, Drs. Reto Fiolka, Katherine Burges, and Huolin Xin, led the session with stimulating talks about their latest research efforts and the next steps they are taking to advance the field. From there, we transitioned to a morning M&M Awardee Social event where Drs. Peter Crozier (MSA President) (Figure 3) and Heather Lowers (MAS President) presented student, postdoctoral, and staff awards and encouraged everyone to virtually socialize with coffee, tea, and donuts!

The technical program of the meeting consisted of 38 symposia covering a full range of topics in the biological,

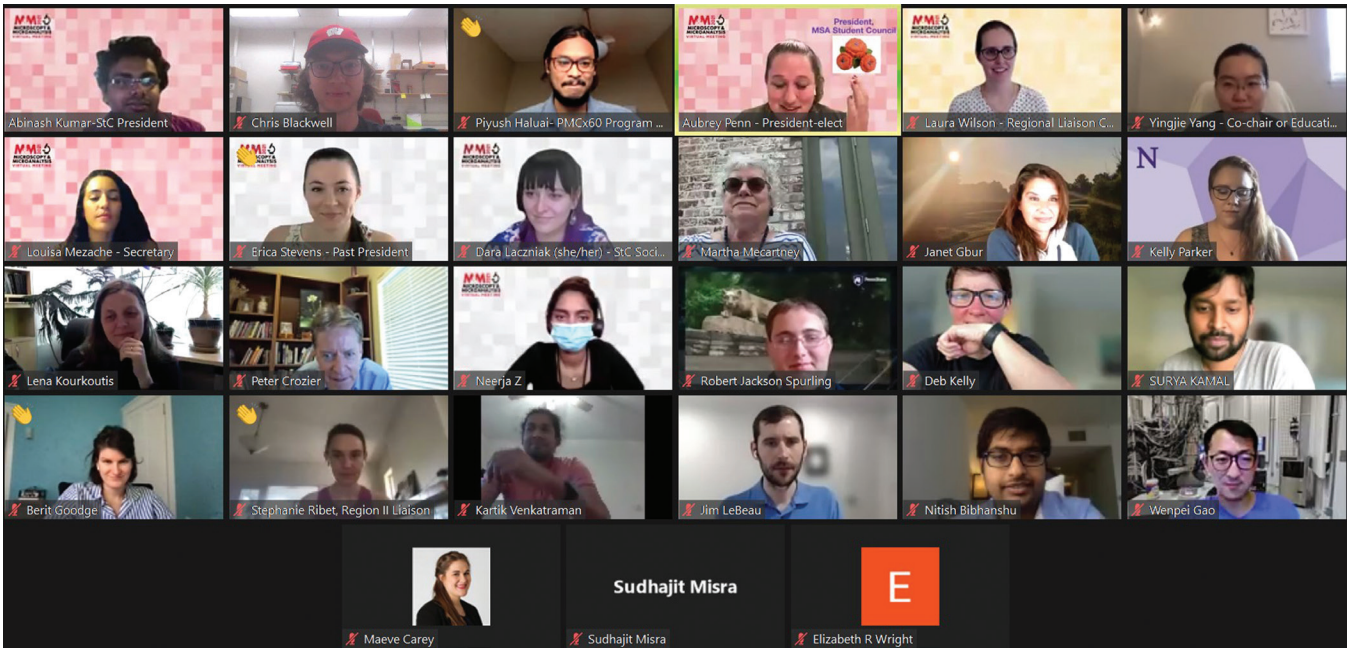

Figure 4: Participants in the virtual Student Mixer.

physical, and analytical sciences. There were so many highpoints in the technical program! One of many highlights of the meeting was symposium A03: "Microscopy and Microanalysis for Real World Problem Solving." In an engaging series of platform and poster presentations, this symposium featured details about how advanced microscopy instruments and techniques are used to define the physical properties of seemingly everyday objects to real unknown "black box" materials.

In planning the meeting, we worked hard to increase the number of virtual spaces for social interactions at this year's meeting: these included the ever-popular Student Mixer (Figure 4), Lens On Diversity series, MAS Meal with a Mentor, MSA/MAS Members Meetings, Virtual Run Group, and many other networking opportunities to support young and older generations alike in making connections. Already, the M&M 2021 meeting social events have spurred members of the community to establish new networking activities outside of the meeting that will continue to grow.

As we prepared for M&M 2021 Virtual, our ambition was to have a meeting where we could connect, albeit remotely, both scientifically and socially. Meeting attendees could engage with meeting content on demand 24/7 and log in for live feeds with coffee in hand! As we look back on M&M 2021, there was stimulating science and many wonderful opportunities and fun ways to connect. Though not the same as being together in person, M&M 2021 Virtual was a success. Our microscopy community is amazing! Let's keep looking and moving forward to an on-site M&M 2022 in Portland, OR July 31–August 4, 2022.

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